

# Chapter 5

## IMPLEMENTATION, MONITORING, AND EVALUATION

### PLAN IMPLEMENTATION

The Forest Plan will be implemented through a series of project-level decisions based on appropriate site-specific analysis and disclosure. It does not contain a commitment to select any specific project. Instead, it provides a framework of Desired Future Conditions with Goals and Objectives to guide project proposals. Projects are proposed to solve resource management problems, move the Forest environment toward the Desired Future Conditions, and supply goods and services to the public. The project area is assessed to determine the Desired Future Condition in contrast to the existing condition and the opportunities in the area. These projects are analyzed to determine possible alternative solutions, and after public involvement, the responsible official makes the decision.

In addition to direction provided by the Forest Plan, projects are implemented through direction found in the directive system (Forest Service Manual and Handbooks), annual program budget, and other implementation guides that are not part of the decisions made in the Forest Plan, but provide specifics on how to implement projects. Examples of implementation guidance includes:

- a) Capital investment program
- b) Forest and public lands highways program
- c) Intermodal Surface Transportation Efficiency Act program
- d) Fire Management Plan
- e) Research Natural Areas establishment records and plans
- f) Threatened and Endangered species recovery plans
- g) Memoranda of understanding

The Forest Supervisor has overall responsibility for Forest Plan implementation. Implementation will occur through the identification, selection, and execution of projects or actions designed to meet the Forest Plan's management direction. Identification of projects will occur in several different ways. The Forest Service will develop project proposals in response to specific management needs or following an assessment of the best way to implement the Plan on a specific portion of the forest. In some instances, project proposals result from applications made to the agency for use and occupancy of National Forest System lands. However project proposals are generated, it is necessary for other plans or instruments, budget proposals, and any specific management practices to be consistent with the Forest Plan. Implementation of project proposals depends upon many factors, including budgets. However, projects must be consistent with the Forest Plan.

The 2004 Forest Plan supersedes the 1985 Plan. All outstanding permits, contracts, cooperative agreements and other instruments for occupancy and use of lands included in the 1985 Plan will be brought into agreement with the 2004 Forest Plan, subject to the valid existing rights of the parties involved. This will be done as soon as practical, generally within three years of the date of the Plan.

Subsequent administrative activities affecting such lands, including budget proposals, will be based on the 2004 Forest Plan.

Often projects and management activities will be proposed following an assessment of how best to achieve the Desired Future Conditions, Goals, and Objectives in a portion of the forest. These plan-to-project assessments will generally be based on a watershed or land area and will provide an integrated look at what actions may be necessary in the area under consideration. The assessments are the intermediate step between programmatic Forest Plan management direction and the site-specific actions taken to implement that direction. The assessments do not directly result in decisions, but will provide options that may yield future projects.

This concept of Plan implementation begins with Forestwide, programmatic direction, leading to site-specific actions, followed by monitoring and evaluation of the results, which are used to make adjustments to programmatic direction. This strategy is also iterative, with information flowing in either direction within various stages of the process. For example, if a proposed practice, project, or action is determined to be incompatible with the direction in the Forest Plan, one of three things will occur:

- a) The proposal will be revised to make it compatible with the 2004 Forest Plan
- b) The proposal will be abandoned
- c) The proposal will be implemented after the 2004 Forest Plan has been amended to provide for the proposed activity.

Recurring conflicts may result in review of the relevant Plan direction through the monitoring and evaluation process to determine whether a Plan amendment or revision is needed.

## **PLAN AMENDMENTS AND REVISION**

A Forest Plan can be amended to ensure that it remains a viable, flexible document for managing the Daniel Boone National Forest. Based on 1982 Planning Regulations, a Plan must be revised on a 10-year cycle or at least every 15 years. It also may be revised whenever the Forest Supervisor determines that conditions or demands in the area covered by the Plan have changed significantly. A five-year review will be conducted to determine whether conditions or demands have changed significantly.

## **PURPOSE OF MONITORING AND EVALUATION**

Monitoring and evaluation provide information to determine whether programs and projects are meeting Forest Plan direction, and whether the cost anticipated to implement the Forest Plan coincides with actual costs. Monitoring and evaluation is required by NFMA implementing regulations (36 CFR 219.12(k)) to determine whether requirements of the regulations and Forest Plan are being met.

This Chapter establishes Monitoring Questions that are to be answered over the course of Forest Plan implementation. Monitoring questions address whether the Desired Future Conditions, Goals and Objectives of the Forest Plan are being met and whether Forest Plan Standards are effective.

Monitoring Questions are part of the Forest Plan and are stated in terms that will direct *what* will be monitored, but are not so specific as to address *how* monitoring will be accomplished.

Monitoring Questions will be further refined during Forest Plan implementation into Monitoring Elements and Task Sheets, which are more detailed, specific and measurable than the Monitoring Questions themselves. Monitoring Elements and Task Sheets may be modified and prioritized to guide monitoring activities over the course of Forest Plan implementation. The Monitoring Summary Table and sample Task Sheet (Appendix D) demonstrate the relationships between Forest Plan Goals, Objectives, Standards and Monitoring Questions, and indicate the nature of Monitoring Elements and monitoring details that are to be further developed during Forest Plan implementation. The Monitoring Summary Table and sample Task Sheet are presented here only for information and may be modified as needed to address changes in needs, priorities, availability of personnel and funding. As part of comprehensive resource management planning for the Red River Wild and Scenic River segment, a separate monitoring and implementation plan can be found in Appendix F.

The Monitoring Questions were developed to address three types of monitoring:

- a) Implementation monitoring
- b) Effectiveness monitoring
- c) Validation monitoring.

**Implementation monitoring is intended to satisfy the question:** *Did we do what we said we would do?* It determines whether plans, prescriptions, projects, and activities are implemented as designed and in compliance with Forest Plan Goals, Objectives, and Standards. Evaluation of implementation monitoring may require adjustment of prescriptions and targets or changes in plan or project administration.

**Effectiveness monitoring is meant to satisfy the question:** *Did what we said we would do accomplish our Goals and Objectives — or, did it work?* It determines whether plans, prescriptions, projects, and activities are effective in meeting management direction, Objectives, and Standards. Results of effectiveness monitoring are used to adjust Forest Plan Objectives, targets, management prescriptions, Standards, conservation practices, mitigation measures, and other best management practices. It could result in a change to, or amendment of, the Forest Plan.

**Validation monitoring is meant to satisfy the question:** *Are our assumptions valid, or are there better ways of meeting our Goals and Objectives?* It is designed to ascertain whether the initial assumptions and coefficients used in developing the Forest Plan were correct or if there is a better way to meet Forest planning regulations, policies, Goals, and Objectives. Evaluation of this type of monitoring can result in amendment to the Forest Plan and may be used to recommend changes in laws, regulations, or policies that affect both the Plan and project implementation.

Monitoring and evaluation are distinct activities. The monitoring phase generally includes the collection of data and information, either by observation, direct measurement or compiling data from appropriate sources. Evaluation is the analysis of this data and information, and is used to assess if the Forest Plan is being implemented correctly and whether it needs to be changed. Forest Plan Monitoring and Evaluations will be reported annually in the Forest Monitoring and Evaluation Report.

Forest Plan amendments and revisions should be responsive to changes that affect the Forest Plan, and may be needed at any time if a Forest Plan becomes out of date in some way. Within an adaptive management<sup>28</sup> framework, the need to amend or revise the Forest Plan may result from:

- a) Recommendations of an interdisciplinary team, based on evaluation and monitoring results
- b) Changes in agency policy and regulations
- c) Planning errors found during Forest Plan implementation
- d) Changes in physical, biological, social, or economic conditions.

The evaluation of findings under the following Monitoring Questions will lead forest managers to these determinations.

## MONITORING QUESTIONS

### 1. Are rare ecological communities being protected, maintained, and restored?

One Forest Plan Goal, along with related Objectives and Standards, is to inventory, maintain and restore rare communities. To monitor accomplishment of these provisions and the effects that overall Forest Plan implementation will have on rare communities, trends in number of occurrences, locations, and conditions, and effects of maintenance and restoration activities will be tracked.

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<sup>28</sup> The concept of adaptive management is foundational for planning and Forest Plan implementation in a dynamic environment. Regulations require that Forest Plans be revised periodically (36 CFR 219.10(g)). However, Forest Plans may need to be more dynamic to account for changed resource conditions (such as large storms or insect outbreaks), new information or findings of science, or new regulations or policies.

## 2. Are landscape- and stand-level composition, structure, and function of major forest communities within desirable ranges of variability?

Success in maintaining and restoring composition, structure, and function of forest ecosystems within desired ranges of variability is reflected by both changes in forest condition and by levels of management and other effects that are shaping these communities. Monitoring will include tracking the abundance of major forest cover/community types and levels of management activities conducted to maintain and restore desired conditions. Population and habitat trends of Management Indicator Species will be monitored to help indicate effects of National Forest management within selected communities.

Management Indicator Species	Reasons for Selection
Black-throated green warbler	Changes in presence and abundance of black-throated green warblers in mature mesic cove deciduous forests will be used to help indicate the effectiveness of management at providing dense understory and midstory structure within these forest communities.
Pine warbler	Trends in populations of this species will be used to help indicate the effectiveness of management at restoring, and maintaining remaining mature pine forests in open, fire-maintained conditions.
Acadian flycatcher	Trends in presence and abundance of this species in mature riparian will be used to help indicate effectiveness of management at maintaining these communities.
Field sparrow, Northern cardinal, Chipping sparrow, Summer tanager	Trends in presence and abundance of these species in areas restored to woodlands, and wooded grasslands/shrublands would be used to help indicate effectiveness of management at establishing desired conditions in these restoration areas.
Northern bobwhite quail	Trends in this species will be used to help indicate the effectiveness of management at restoring, and maintaining a habitat mosaic of yellow pine and yellow pine-hardwood woodland and wooded grassland and grassland.

### 3. Is habitat diversity being provided?

Forest Goals, Objectives, and Standards have been established for maintaining a balance between age classes in major forest communities. Some wildlife species depend on young forest or early successional habitat conditions, while others depend on older forest. Trends in the relative abundance of age classes and abundance of habitat conditions, such as early-successional habitat, mature forest interiors, old-growth, and permanent grassy openings, will be monitored. Population trends of Management Indicator Species selected to help indicate effects of management on these habitats will be monitored.

Management Indicator Species	Reasons for Selection
<b>Prairie warbler</b>	Trends in presence and abundance of this species in young (0-10 years old) yellow pine or mixed yellow-pine-oak forests will be used to help indicate the effectiveness of management in achieving desired conditions within these habitats.
<b>Yellow-breasted chat or eastern Towhee</b>	Trends in presence and abundance of this species in young (0-10 years old) forests will be used to help indicate the effectiveness of management in achieving desired conditions within these habitats.
<b>Cerulean warbler</b>	Changes in presence of this species in areas that provide mature, moderate density (70-90 sq ft/ac) upland oak dominated forest habitats will be used to indicate effectiveness of management in achieving desired conditions within these sites.
<b>Field sparrow</b>	Trends in presence and abundance of this species in grassy openings will be used to help indicate the effectiveness of management in achieving desired conditions within these habitats.
<b>Ovenbird</b>	Trends in presence and abundance of this species in mature deciduous or mixed forests will be used to help indicate the effectiveness of management in maintaining desired condition relative to forest interior habitats.

### 4. How well are terrestrial habitat attributes being provided?

Special habitat attributes such as hard and soft mast, den trees, snags, and downed wood are necessary elements for certain species. A variety of Forest Plan Goals, Objectives, and Standards provide for the protection, restoration, and maintenance of these elements. Trends in the abundance and condition of terrestrial habitat attributes will be monitored.

## 5. What is the status and trend in aquatic habitat conditions in relationship to aquatic communities?

The Forest Plan provides for protection and restoration of riparian ecosystems, wetlands, and aquatic systems and for assuring that aquatic habitat conditions are suitable to maintain native aquatic communities. Indices based on macroinvertebrate assemblages, that reflect the community structure and function, combined with physical and chemical parameters of the aquatic system will be monitored. These indices are not individual, or groups of species, and therefore will not be referred to as Management Indicator Species.

Macroinvertebrate indices	Reasons for Selection
Indices based on aquatic macroinvertebrate assemblages.	Macroinvertebrates are widely distributed throughout the DBNF. They can be found in nearly every stream and body of water on the Forest. The indices, which are a numerical representation of the community structure and function, accurately reflect the health of the aquatic habitat being evaluated. These indices can be reliably compared between streams with similar size.

## 6. What are status and trends of forest health threats on the Forest?

Measures designed to control or mitigate negative effects of insects, disease, non-native invasive species, air pollution, and high fuel loading is important aspects of this Forest Plan. Trends in occurrence and effects of air pollutants, wildland fire, insects and diseases, and non-native invasive species will be monitored.

## 7. What are the status and trends of federally listed species and species with viability concerns on the forest?

Contribution to conservation and recovery of federally listed Threatened and Endangered species is an important Goal of this Forest Plan. Trends in occurrence or abundance of these species will be monitored along with levels of management activities implemented for the purpose of achieving recovery.

Maintaining habitat capable of supporting viable populations of native and desired non-native species is also an important Goal of the Forest Plan. Many Objectives and Standards are designed to meet this Goal. Monitoring will focus on trends for populations and/or habitats of species of viability concern. Where feasible, species monitoring will often be accomplished by monitoring communities of species (e.g., fish, bats, birds).

Management Indicator Species	Reasons for Selection
Pitch pine	Trends in populations of this species will be used to indicate effectiveness of management activities designed specifically to maintain viability of this species.

## 8. What are the trends for demand species and non-timber forest products and their use?

The DBNF provides large public ownership with opportunities for hunting, fishing, wildlife viewing, and collection of non-timber forest products. Monitoring of some demand species populations and/or harvest levels will be done in coordination with the Kentucky Dept. of Fish and Wildlife Resources (KDFWR) or the Kentucky State Nature Preserves Commission. One of these species is selected as a Management Indicator Species where effects of National Forest management are important to meeting public demand, and monitoring assistance from KDFWR is available. Some species that are collected as non-timber forest products will be monitored through management of the permitting process.

Management Indicator Species	Reasons for Selection
White-tail deer	Trends in harvest levels and hunting demand will be used to help indicate effectiveness of management in meeting public demand for this species.

## 9. Are high quality, nature-based recreation experiences being provided and what are the trends?

The DBNF offers a unique combination of nature-based dispersed recreation, including undeveloped settings, built environments that re-enforce natural character, and wildland settings that complement enjoyment of special places. This Plan aims to provide for safe, natural, well-designed, accessible, and well-maintained recreational opportunities for all visitors. Monitoring visitor experiences and the condition of facilities will help gauge the effectiveness in meeting this commitment.

## 10. What are the status and trends of recreation use impacts on the environment?

This Forest Plan is committed to providing recreational opportunities that are compatible with stewardship of Forest resources. Impacts of motorized uses, site occupancy, and large volumes of users on riparian, stream, and aquatic resources, vegetation, and soils will be monitored.

## 11. What is the status and trend of Wilderness character?

Wilderness character is comprised of both human and biophysical elements. Monitoring the human elements requires monitoring trends in the human experiences, i.e., solitude, crowding, etc., as well as trends in the use patterns and visitor impacts. User monitoring and surveys will allow for tracking trends among visitors to Wilderness, while trailhead use and identification of sites with impacts will allow us to track movement and activities within Wilderness and relationships to biophysical effects. Monitoring biophysical elements is important for tracking changes to the natural systems due to natural and human influences within and outside the Wilderness. Although there are many components to the biophysical element, air quality is viewed as a basic indicator of Wilderness health.



**12. What are the status and trend of Wild and Scenic River conditions?**

The two main elements in determining the eligibility and suitability of a river for inclusion in the National Wild and Scenic Rivers System are a free-flowing condition and the presence of Outstandingly Remarkable Values. Rivers determined to be eligible, or eligible and suitable, which have not yet been designated by Congress must have those elements protected until a further designation is assigned. Monitoring changes to these elements will help us evaluate our management of these rivers on our forests.

**13. Are the scenery and recreation settings changing and why?**

Scenery and recreational settings are managed by establishing Scenic Integrity Objectives (SIO) and Recreation Opportunity Spectrum (ROS) management direction. Management of scenery and settings are essential in the management of recreational experiences and the quality of the environment. Changes in scenic quality of the forest and recreation settings will be monitored.

**14. Are heritage sites being protected?**

Compliance with the National Historic Preservation Act is essential during Forest Plan implementation. Before an undertaking occurs, sites eligible for placement on the National Register of Historic Places must be identified and protected. Monitoring will be done to assess how well sites are being identified for protection and whether site protection measures is effective in preventing site loss.

**15. Are watersheds maintained (and where necessary restored) to provide resilient and stable conditions to support the quality, quantity, and timing of water necessary to protect ecological functions and support intended beneficial uses?**

This Forest Plan provides for management of watersheds to provide resilient and stable conditions to support the quality, quantity, and timing of water necessary to protect ecological functions and support intended beneficial water uses. Numerous best management practices are established as Standards for practices to be carried out during implementation of the Forest Plan. Watershed condition, improvement needs, water quality, and implementation of best management practices will be monitored. The Forest Service will share results of water quality monitoring results with the Kentucky Division of Water for use in broader water quality assessments and TMDLs.

**16. What are the conditions and trends of riparian area, wetland and flood plain functions and values?**

Riparian ecosystems restoration and management is important to maintain aquatic resources and values. Desired conditions, including the composition and structure of vegetation, equipment limitations, maintaining ground cover and stable stream banks are established in the Forest Plan. Flood plains and wetlands are to be protected. Riparian management practices and Standards, ground cover, stream bank stability, and wetland and flood plain status will be monitored.

**17. How do actual outputs and services compare with projected? [36 CFR 219.12(k)1]**

The 1982 NFMA implementing regulations require that outputs and services will be monitored and compared to those projected in the Forest Plan. Trends in forest product, mineral leasing and surface rights, access and road conditions, and Forest Plan implementation costs will be tracked and compared to projections made at the time the Forest Plan was developed.

**18. Are silvicultural requirements of the Forest Plan being met?**

The 1982 NFMA implementing regulations also require monitoring of specific silvicultural requirements. Silvicultural practices, harvest methods, harvest unit size, regeneration establishment, and land suitability for timber productions will be monitored and evaluated to determine if and when changes may be needed.

**19. Are Forest Plan Objectives and Standards being applied and accomplishing their purpose?**

Periodic review of Objectives and Standards established in the Forest Plan is called for to assure that desired condition are being achieved and that these requirements will stay current given Forest Plan modifications, changed conditions and new information that accumulate over time. Implementation and effectiveness of best management practices and other Standards will be tracked and periodically evaluated.

**RESEARCH NEEDS**

Research and monitoring are related activities that help to meet information needs for adaptive management of National Forests. Research involves rigorous study under controlled conditions, following the scientific method. Research activities include study planning, design, quality control, peer review, and relatively rigid publication standards. Monitoring, in contrast with research, is generally conducted under less controlled conditions and results are often more general. Research needs for management of the National Forests are to be identified during planning and periodically reviewed during monitoring and evaluation of implemented Forest Plans (36 CFR 219.28).

Research needs identified during development of this Forest Plan are listed in Appendix E. Research needs identified while monitoring the implementation of the Forest Plan will be reported in Annual Monitoring and Evaluation Reports.